

REPORT TO THE ALASKA BOARD OF FISHERIES ON THE  
1996 BRISTOL BAY RED KING CRAB FISHERY

by

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## **KING CRAB REGISTRATION AREA T BRISTOL BAY**

### ***Introduction***

The Bristol Bay king crab Area T includes all waters north of Cape Sarichef, east of 168° West longitude and south of the latitude of Cape Newenham and includes all waters of Bristol Bay (Figure 1).

### ***Historic Background***

Commercial king crab fishing in the Bering Sea began with the Japanese in 1930. Their presence continued in this fishery until 1940 and then again from 1953 until 1974. The Russian king crab fleet operated in the eastern Bering Sea from 1959 through 1971. United States fishermen entered the eastern Bering Sea fishery with trawl gear in 1947. Effort and catches declined in the 1950's with no catch being reported in 1959. A period of fluctuating low catches followed through 1966 before expanding into a full scale fishery in the late 1970's.

The king crab fishery in the eastern Bering Sea traditionally harvested red king crab from waters north of Unimak Island and the Alaska Peninsula from Cape Sarichef to Port Heiden. With the decline of king crab stocks in other areas of the state in 1968, U. S. effort increased in the eastern Bering Sea with a record catch of 129.9 million pounds in 1980 ( Figure 2 and Table 1). As in other areas of the state, the stocks crashed in the early 1980's and have remained depressed.

In 1980 the Board of Fisheries defined that portion of the Bering Sea south of Cape Newenham and east of 168° West Longitude as the Bristol Bay King Crab Registration T. This area was made an exclusive registration area. During any king crab registration year (June 28 through June 27), vessels registering for and fishing in this area are prohibited from fishing in any other exclusive or super exclusive registration areas. Only non exclusive areas (the Bering Sea Area Q and or Aleutians Area O) could subsequently be fished.

The National Marine Fisheries Service (NMFS) has conducted annual trawl abundance index surveys of the eastern Bering Sea since 1968. This multi-species (crab and groundfish) survey is conducted during the summer months and resulting area-swept estimates of abundance are published annually. In 1983, the NMFS trawl survey of the Bering Sea indicated a record low number of legal male crab and the lowest total king crab population ever recorded. Small females carrying fewer eggs and high predator abundance was also noted. As a result, the fishery was closed for the 1983 season. In 1984 the fishery reopened and catches slowly increased to over 20.3 million pounds in 1990. Due to the large number of catcher-processors and floating processors participating in the fishery and the inability of the Department to monitor their harvest, an observer program was initiated in 1988. Fishing effort increased dramatically from 89 vessels in 1984 to over 300 vessels in 1991. The number of pots being fished by the fleet also increased, with almost 90,000 pots registered for the 1991 fishery.

As a result of the increased number of pots, the Board of Fisheries established a 250 pot limit which was implemented for the 1992 Bristol Bay red king crab fishery. This measure was intended to improve manageability of the fishery by extending the length of the season and reduce the potential for pot loss. Pot limits were applied through a buoy sticker program.

Immediately following the 1992 Bristol Bay red king crab fishery, the 250 pot limit was repealed by the National Marine Fisheries Service (NMFS). This action was due to perceived inconsistencies with provisions of the Bering Sea/Aleutian Island king and Tanner crab Federal Management Plan (FMP) which mandated application of pot limits in a nondiscriminatory manner. In the spring of 1993 the Alaska Board of Fisheries passed new regulations which set pot limits based on overall vessel length. For the Bristol Bay king crab fishery vessels in excess of 125 feet in overall length were limited to 250 pots and vessels 125 feet and under in length overall were allowed 200 pots total. These pot limits were, and continue to be, implemented through a buoy tag program from the Dutch Harbor and Kodiak Alaska Department of Fish and Game (ADF&G) offices.

Harvest shortfalls during both the St. Matthew blue king and Pribilof Islands red king crab fisheries in mid-September 1993 prompted a meeting in Seattle between fishermen, industry representatives and staff from ADF&G and NMFS. They discussed methods to improve in-season data collection and management. At that meeting, a sales representative from MCI Communications Incorporated presented information about satellite communications software currently available for confidential communication between ADF&G and vessels at sea, which could be used for daily in-season catch reporting. As a result of this meeting, ADF&G purchased the necessary computer hardware and software for retrieval of daily satellite transmitted catch messages from vessels at sea.

Daily vessel reports received via single side band radio and MCI telex were used to manage the 1993 Bristol Bay red king crab fishery. That season ran for 9 days and the total harvest was 14.6 million pounds, approximately 2.2 million pounds short of the 16.8 million pound harvest guideline midpoint.

Results of the NMFS 1994 summer trawl survey of the Eastern Bering Sea indicated declines in all size classes of both male and female red king crab in the Bristol Bay area. Compared to observations made during the 1993 survey, the abundance index of large male crab declined 25%. Based on 1994 survey results, large female abundance was estimated at 7.5 million crabs, which was below the minimum threshold of 8.4 million crab necessary to allow a fishery. As a result, the Bristol Bay area was not open to fishing for the 1994 season.

Due to measurement errors in the area-swept trawl abundance estimates, ADF&G developed a length-based analysis (LBA) for estimating population abundance. This method, used for the first time prior to the 1995 season, incorporates a variety of data sources, such as dock side sampling and observer collected data, as well as data collected on the annual survey. This method is less susceptible to year-to-year variations in factors unrelated to population abundance, for example, oceanographic conditions, changes in species distribution and subsequent availability to the survey gear; therefore estimations of abundance are likely more accurate. Analysis of the 1995 NMFS survey using the LBA indicated no significant difference in the abundance of mature male and

female red king crab from estimates made from the 1994 survey. As a result the Bristol Bay red king crab fishery remained closed for the 1995 season.

### *Status of Stocks*

Due to the depressed nature of the Bristol Bay red king crab population, the Alaska Board of Fisheries, at their March 1996 meeting, adopted a revised management plan to promote stock rebuilding. Among changes to the management plan was a reduction in the exploitation rate of mature male crab from 20% down to 10%. This exploitation rate would be applied as long as the effective spawning biomass remained below 55 million pounds.

Results from the LBA analysis of the 1996 NMFS survey indicated slight increases of all size classes of males and females from the 1995 estimate. Recruitment of males to the surveyed stock increased from 2.2 to 3.6 million crabs and females increased from 1.8 to 3.9 million crabs. Most significant, relative to the prior two season closures due to insufficient numbers of large (> 89 mm carapace length) female crabs, was an increase in the number of large females in 1996 to 10.2 million crabs. This estimate of large females was well above the 8.4 million large female threshold necessary for a fishery. Most of the change in the status of the Bristol Bay stock from 1995 to 1996 was attributed to recruitment of young crabs to the surveyed stock. Based on a 10% exploitation rate of the estimated 7.795 million mature male crabs, the 1996 GHF was set at 5.0 million pounds.

### *1996 Fishery*

The Bristol Bay Management Area T opened to fishing for king crab (red and blue) and *C. bairdi* Tanner crab at 12:00 noon, November 1, 1996. A total of 196 vessels, including 4 catcher processors made 198 landings for a total harvest of 8.4 million pounds of red king crab and over 980,000 pounds of *C. bairdi* Tanner crab. The 1996 fishery lasted a total of four days and was closed by emergency order at 12:00 noon on November 5. One floating processor also registered and purchased crab on the grounds during the fishery.

A total of 196 vessels purchased 39,784 buoy tags for the 1996 red king crab fishery. This compares to a total of 292 vessels which registered a total of 58,881 pots for the 1993 season. Of the 196 vessels which participated in 1996, all but one also registered to retain *C. bairdi* Tanner crab.

Tank inspections begin at 12:00 noon on October 31, 24 hours prior to the fishery opening. ADF&G personnel conducted a total of 56 tank inspections in King Cove, 39 in Akutan, three in St. Paul and 98 in Dutch Harbor. In addition to vessel hold inspections, ADF&G staff examined fishing gear aboard all vessels for pot mesh, tag and tunnel size requirements.

The 1996 Bristol Bay king crab fishery was managed by means of daily inseason reports from fishermen. A total of 118 vessel operators or 60.2% of participants, from both the small (<125

feet) and large (126 feet and larger) vessels groups signed up to report numbers of pots fished and number of crab retained daily. The total number of vessels which actually reported ranged from 86 (43% of the fleet) on November 3 to 36 (18% of the fleet) on November 5. Number of vessels reporting declined after the fishery closure was announced on November 3<sup>rd</sup>. Reports were received via marine telex and over single side band radio.

Fishery performance, calculated from daily fishermen reports, indicated catches in excess of 20 crab per pot during the first full reporting period, which ended at 6:00 a.m. on November 3. Based on this information, which resulted in a projected daily catch of approximately 2.7 million pounds, it was determined the GHL of 5 million pounds would be harvested with less than two additional days of fishing. In anticipation of a reduction in fishery performance, and in order to provide the fleet sufficient time to place all fishing gear in long-term storage (bait jars out and pot doors secured fully open), the fishery was closed at 12:00 noon on November 5. The fishery closure announcement was faxed to all processors and fisheries related organizations on the department's Westward Region fax distribution list and put out over single side band radio on frequency 4125 at 3:00 p.m. on November 3, 1996.

Catch projections based on inseason reports through November 5 indicated a total harvest of 8.2 million pounds and a fishery CPUE of 16.4 crab per pot pull. This is similar to the 8.4 million pound harvest and fishery CPUE of 16 crab per pot pull calculated from fishtickets post season. The 1996 CPUE of 16 crab per pot pull is considerably higher than the 6 to 12 crab per pot average observed in the preceding four Bristol Bay king crab fisheries and is the highest on record since the 1980 season (Table 1).

Total pot pulls projected for the fishery, based on inseason reports, was 72,438. This is similar to the 76,433 pot lifts calculated from fishtickets and is a dramatic reduction from the 253,794 pot pulls recorded for the 1993 fishery (Table 2). Comparing the 76,433 reported pot pulls for the 1996 fishery against the 39,784 pots registered, it appears fishermen pulled their pots an average of 1.9 times over the course of the fishery. This compares to an average of 4.3 pulls for each pot registered for the 1993 season.

Average weight of this year's red king crab was in excess of 6.7 pounds. This is an increase from the 6.5 pound average weight observed in 1993 and among the highest observed average weight for Bristol Bay red king crab since the 1967 season (Table 1). The increase in this year's average weight is thought to be, in part, due to an accumulation of post-recruit crab resulting from a fishery closure in 1994 and 1995.

Exvessel price of Bristol Bay red king crab for the 1996 season was \$4.00 per pound. This year's fishery was valued at \$33.6 million. This compares to an exvessel value of \$3.80 and a fishery value of \$55.1 million for the 1993 season (Table 3).

Post-recruit crab, those crab which have been legal for more than one year, made up 69% of this year's harvest. The remaining 31% was made up of recruit size crab, the majority of which were new shell animals between 137 and 149 millimeters carapace length. The absence of removals of legal sized animals from the stock, as a result of the 1994 and 1995 fisheries closures, may be

the reason this year's post-recruit percentage was slightly higher than the 67% observed during the 1993 fishery (Table 3).

The majority of this year's harvest came from five statistical areas located in the center of the Bristol Bay Management Area between 162° and 164° West Longitude and 56° and 57° North Latitude. This is the traditional area of harvest and the same general area were the majority of the harvest occurred in 1993 (Table 4).

At the time of the closure marine weather reports for the Bering Sea and Aleutian Islands indicated winds to 70 knots and seas to 35 feet. These conditions slowed the fishing progress of some vessels and resulted in approximately 20 vessels failing to make their delivery location within the 24 hours following the fishery closure as specified in regulation. Due to prevailing conditions, no vessels were cited for late delivery. One vessel was cited for fishing within the Bristol Bay registration area within the 14 days prior to the Bristol Bay fishery in accordance to 5 AAC 34.053 (1).

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Table 1. Bristol Bay, Area T of the Bering Sea, historic red king crab catch statistics, 1966-1996

Year	Number of			Harvest <sup>a,b</sup>	Pots Pulled	Average		CPUE <sup>d</sup>	% Old Shell	Deadloss <sup>b</sup>
	Vessels	Landings	Crab <sup>a</sup>			Weight <sup>c</sup>	Length <sup>c</sup>			
1966	9	15	140,554	997,321	2,720	7.1		52		
1967	20	61	397,307	3,102,443	10,621	7.8		37		
1968	59	261	1,278,592	8,686,546	47,496	6.8		27		
1969	65	377	1,749,022	10,403,283	98,426	5.9		18		
1970	51	309	1,682,591	8,559,178	96,658	5.1		17		
1971	52	394	2,404,681	12,955,776	118,522	5.4		20		
1972	64	611	3,994,356	21,744,924	205,045	5.4		19		
1973	67	441	4,825,963	26,913,636	194,095	5.6		25		N/A
1974	104	605	7,710,317	42,266,274	212,915	5.5		36		N/A
1975	102	592	8,745,294	51,326,259	205,096	5.7		43		1,639,483
1976	141	984	10,603,367	63,919,728	321,010	6.0	148	33	27.4	875,327
1977	130	1,020	11,733,101	69,967,868	451,273	5.9	148	26	13.0	730,279
1978	162	926	14,745,709	87,618,320	406,165	5.8	147	36	6.9	1,273,037
1979	236	889	16,808,605	107,828,057	315,226	6.4	152	53	10.4	3,555,891
1980	236	1,251	20,845,350	129,948,463	567,292	6.2	151	37	11.0	1,858,668
1981	177	1,026	5,307,947	33,591,368	542,250	6.3	151	10	47.4	711,289
1982	90	255	541,006	3,001,210	141,656	5.6	145	4	24.6	95,834
1983				N O C O M M E R C I A L F I S H E R Y						
1984	89	137	794,040	4,182,406	112,556	5.2	142	7	26.5	35,601
1985	128	130	796,181	4,174,953	85,003	5.5	142	9	25.8	6,436
1986	159	230	2,099,576	11,393,934	178,370	5.4	142	12	25.5	284,127
1987	236	311	2,122,402	12,289,067	220,871	5.8	145	10	19.0	120,388
1988	200	201	1,236,131	7,387,795	153,004	6.0	147	8	15.1	23,537
1989	211	287	1,684,706	10,264,791	208,684	6.1	148	8	17.7	81,334
1990	240	331	3,120,326	20,362,342	262,131	6.5	152	12	14.7	116,527
1991	302	324	2,630,446	17,177,894	227,555	6.5	152	12	12.1	119,670
1992	281	289	1,196,958	8,043,018	205,940	6.7	153	6	22.3	9,000
1993	292	361	2,261,287	14,628,639	253,794	6.5	152	9	15.2	133,442
1994				N O C O M M E R C I A L F I S H E R Y						
1995				N O C O M M E R C I A L F I S H E R Y						
1996*	196	198	1,249,005	8,405,614	76,433	6.7	153	16	24.3	24,166

<sup>a</sup>Deadloss included.<sup>d</sup>Defined as catch per pot pull.<sup>b</sup>In Pounds.<sup>c</sup>Not including 117,500 pounds landed in Test Fishery.<sup>e</sup>In millimeters

Table 2. Historic Bristol Bay red king crab economic performance.

Year	GHL <sup>a</sup>	Season Total <sup>b</sup>	Number of		Number of Pots		Value		Season Length	
			Vessels	Landings	Registered	Pulled	Exvessel	Total <sup>c</sup>	(Days)	Dates
1980	70 - 120	128,089,795	236	1,251	78,352	567,292	\$ 0.90	\$115.3	(40)	09/10-10/20
1981	70 - 100	32,880,079	177	1,026	75,756	542,250	\$ 1.50	\$ 49.3	(91)	09/10-12/15
1982	10 - 20 <sup>d</sup>	2,905,376	90	255	36,166	141,656	\$ 3.05	\$ 8.8	(30)	09/10-10/10
1983			N O C O M M E R C I A L F I S H E R Y							
1984	2.5- 6.0	4,146,805	89	137	21,762	112,556	\$ 2.60	\$ 10.8	(15)	10/01-10/16
1985	3.0- 5.0	4,168,517	128	130	30,117	85,003	\$ 2.90	\$ 12.1	(8)	09/25-10/02
1986	6.0-13.0	11,109,807	159	230	32,468	178,370	\$ 4.05	\$ 45.0	(13)	09/25-10/07
1987	8.5-17.7	12,168,679	236	311	63,000	220,871	\$ 4.00	\$ 48.7	(12)	09/25-10/06
1988	7.5	7,364,258	200	201	50,099	153,004	\$ 5.10	\$ 37.6	(8)	09/25-10/02
1989	16.5	10,183,457	211	287	55,000	208,684	\$ 5.00	\$ 50.9	(12)	09/25-10/06
1990	17.1	20,245,815	240	331	69,906	262,131	\$ 5.00	\$101.2	(12)	11/01-11/13
1991	18.0	17,058,224	302	324	89,068	227,555	\$ 3.00	\$ 51.2	(7)	11/01-11-08
1992	10.3	8,034,018	281	289	68,189	205,940	\$ 5.00	\$ 40.0	(7)	11/01-11/08
1993	16.8	14,495,197	292	361	58,881	253,794	\$ 3.80	\$ 55.1	(9)	11/01-11/10
1994			N O C O M M E R C I A L F I S H E R Y							
1995			N O C O M M E R C I A L F I S H E R Y							
1996	5.0	8,381,448	196	198	39,784	76,433	\$ 4.01	\$ 33.6	(4)	11/01-11/05

<sup>a</sup>Guideline Harvest Level (millions of pounds).<sup>b</sup>Millions of pounds, deadloss not included.<sup>c</sup>Millions of dollars.<sup>d</sup>Inseason revision to 4.7 million pounds.

Table 3. Bristol Bay red king crab harvest composition by fishing season, 1973-1996.

Season	Date Opened-Closed	Harvest <sup>a</sup>	Percent Recruit	Percent Postrecruit	Size Limit <sup>b</sup>	Price/ Pound
1973	06/15-09/09	26.9	63	37	6½	\$0.84
1974	07/29-10/12	42.2	60	40	6½	\$0.38
1975	08/01-11/16	51.3	21	79	6½ <sup>c</sup>	\$0.38
1976	08/15-12/07	63.9	56	44	6½	\$0.58
1977	09/15-12/08	70.0	67	33	6½	\$1.11
1978	09/10-10/23	87.6	75	25	6½	\$1.23
1979	09/15-10/14	107.8	47	53	6½	\$1.01
1980	09/10-10/20	129.9	44	56	6½	\$0.90
1981	09/10-10/20	33.6	-	-	6½	-
	10/25-12/15	1.5	14	86	7	\$1.50
1982	09/10-10/10	3.0	68	32	6½	\$3.05
1983		N O	C O M M E R C I A L	F I S H E R Y		
1984	10/01-10/16	4.2	59	41	6½	\$2.60
1985	09/25-10/02	4.2	66	34	6½	\$2.90
1986	09/25-10/07	11.4	65	35	6½	\$4.05
1987	09/25-10/06	12.3	77	23	6½	\$4.00
1988	09/25-10/02	7.4	59	41	6½	\$5.10
1989	09/25-10/06	10.3	58	42	6½	\$5.00
1990	11/01-11/13	20.4	49	51	6½	\$5.00
1991	11/01-11/08	17.2	44	56	6½	\$3.00
1992	11/01-11/08	8.0	33	67	6½	\$5.00
1993	11/01-11/10	14.6	33	67	6½	\$3.80
1994		N O	C O M M E R C I A L	F I S H E R Y		
1995		N O	C O M M E R C I A L	F I S H E R Y		
1996 <sup>d</sup>	11/01-11/05	8.4	31	69	6½	\$4.01

<sup>a</sup>Deadloss included, millions of pounds.<sup>b</sup>Minimum carapace width in inches.<sup>c</sup>6½ inches after 11/01.<sup>d</sup>New shell greater than 149 mm defined as postrecruits.

Table 4. Bristol Bay red king crab catch by statistical area, 1996.

Statistical Area	Landings	Crab <sup>a</sup>	Pounds <sup>a</sup>	Pots Lifted	Average		Dead-loss <sup>b</sup>
					CPUE	Weight	
605630	5	16,929	113,197	1016	16.7	6.69	249
615601	6	17,957	123,241	929	19.3	6.86	301
615630	24	113,623	766,447	6364	17.9	6.75	2,848
615700	1	1,259	8,674	93	13.5	6.89	
625200	1	6,022	41,941	400	15.1	6.96	152
625531	2	8,957	57,164	500	17.9	6.38	144
625600	56	281,571	1,893,763	17,398	16.2	6.73	3,004
625630	87	505,643	3,369,448	30,686	16.5	6.66	9,285
625700	2	12,476	84,750	440	28.4	6.79	491
635530	2	10,891	75,737	806	13.5	6.95	5
635600	24	107,593	737,049	6,419	16.8	6.85	2,619
635630	32	135,401	922,272	8,712	15.5	6.81	4,463
635700	3	9,084	63,721	880	10.3	7.01	145
645630	2	5,964	42,328	490	12.2	7.10	110
655630	1	4,500	31,274	600	7.5	6.95	20
675630	1	11,135	74,608	700	15.9	6.70	330
TOTALS	198	1,249,005	8,405,614	76,433	16.3	6.73	24,166

<sup>a</sup> Deadloss included

<sup>b</sup> Pounds

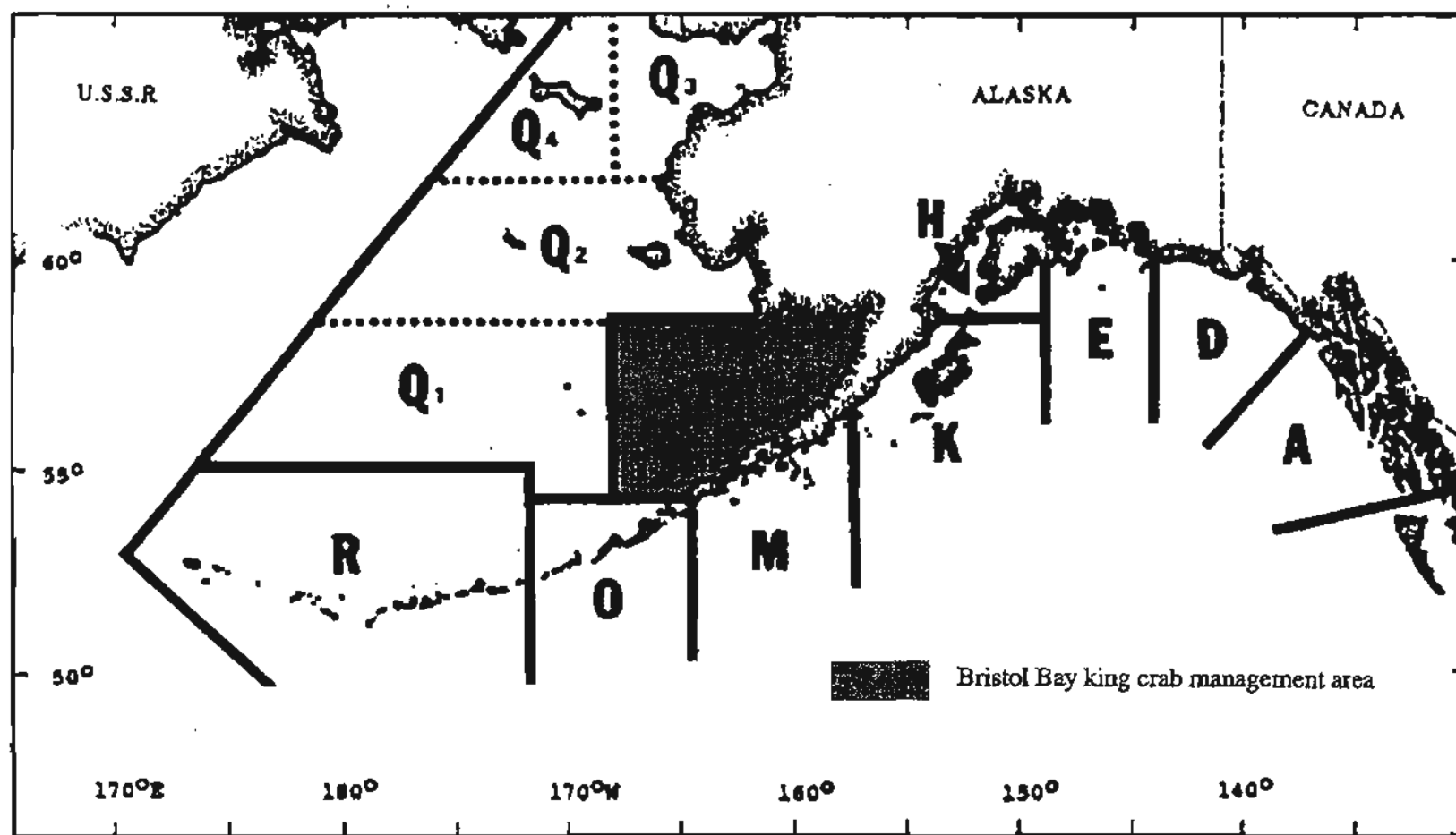


Figure 1. Bering Sea and Aleutian Island crab management areas.

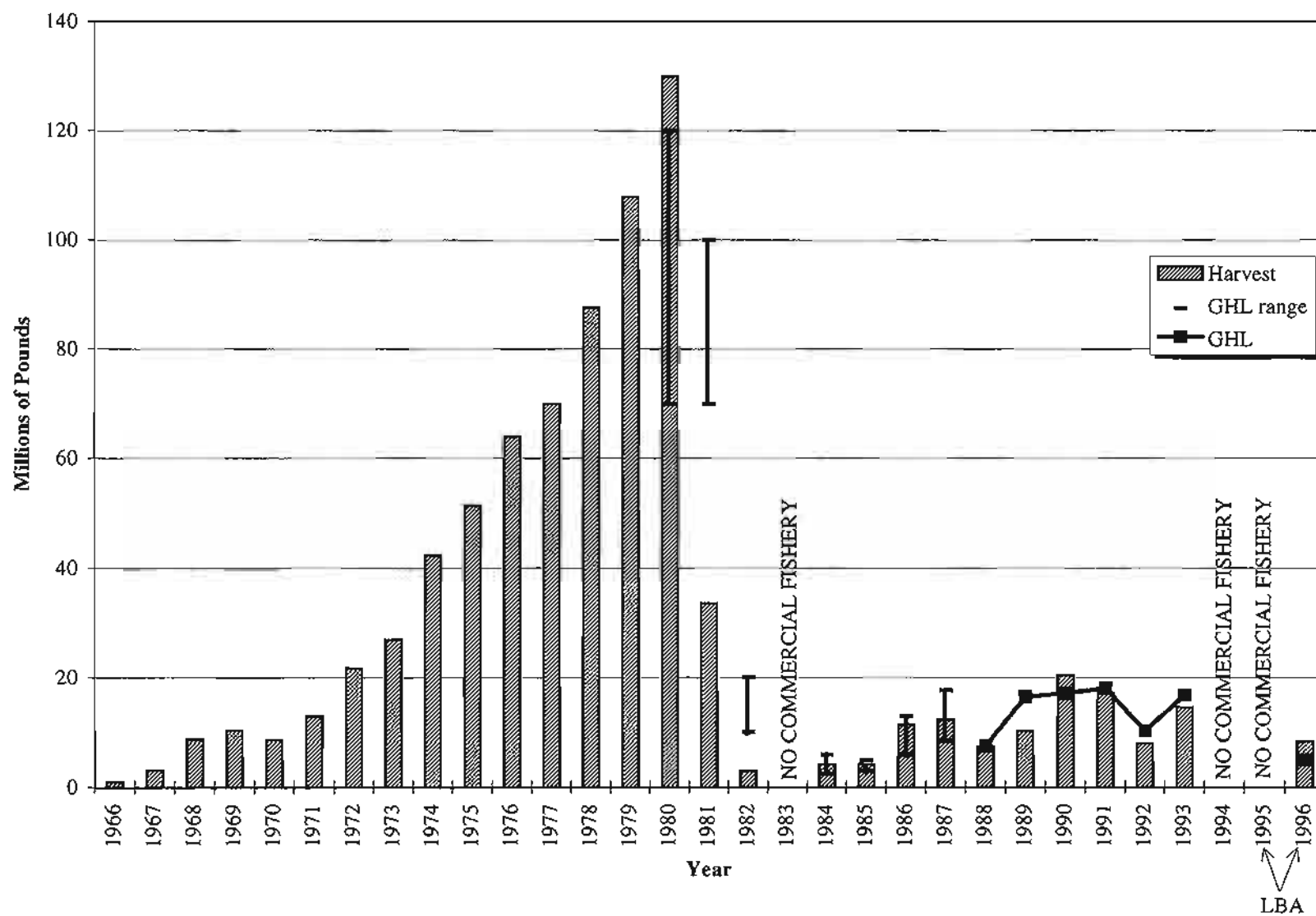


Figure 2. Bristol Bay red king crab harvest and GHL range, 1966 - 1996.

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